

Staff Analysis of Proposed Early Action for Climate Change Mitigation in California

1. Early Actions Strategy Name and Proponent

SUMMARY # *B02*
ID NUMBER: *N/A*
TITLE: *REDUCTION OF HFC-134a EMISSIONS FROM
NONPROFESSIONAL SERVICING OF MOTOR VEHICLE AIR
CONDITIONING SYSTEMS (MVACS)*
PROPONENT: *2007 EARLY ACTIONS FINAL REPORT AND 2006 CAT
REPORT*

2. Staff Recommendation

Staff recommends that this strategy be retained as a discrete early action as approved by the Board during its June 21, 2007 hearing. The form of the regulation has not been developed and CARB staff is considering an industry proposal as well as a restriction on the sale of small cans of refrigerant. Staff recognizes that the latter strategy will place some economic hardship on the low-income sector of the public. The Environmental Justice Advisory Committee and certain Board members have expressed some concerns about this regulatory proposal. Whichever approach is taken, the reductions in emissions that can be achieved is significant considering the amount of effort.

3. Early Action Description

This regulatory measure would reduce the emissions of high-GWP refrigerants by non-professionals who recharge their leaking automotive air conditioning systems. This strategy would apply predominantly to the individual who recharges their personal vehicles' air conditioner(s). These individuals typically do not have the know-how to either repair their leaking MVACS, or the proper equipment to correctly re-charge the system. HFCs are potent GHGs. Specifically, HFC-134a, used nearly universally in motor vehicle air conditioning systems, has a GWP of 1300 as compared to CO₂ (with a GWP of 1). The focus of this strategy is to eliminate the unnecessary releases of HFC-134a when cans are used to recharge leaky MVACS. The source of these emissions include the leaking A/C unit that is never repaired, the breaching of the system in re-charging the MVACS, and the discarding of the refrigerant can containing the unused portion of the refrigerant. As mentioned previously, the exact nature of this proposed measure has not been determined. CARB staff is considering a concept restricting the sales of small cans of refrigerant as well as an industry proposal that would reduce emissions from the unused refrigerant remaining in the used can. CARB staff intends to work with industry in an evaluation process to characterize the emission reductions, technical feasibility, and cost effectiveness of each option. The most viable alternative will be brought to the Board for their consideration.

4. Potential Emission Reductions

Potential emission reductions for the sale restriction option have been estimated to be in the range of from 1 to 2 MMTCO₂E in 2012 that would give an emission reduction potential rating of large. The industry proposal would result in estimated reductions ranging from less than 0.1 MMTCO₂E to approximately 1 MMTCO₂E which would give an emission reduction potential of medium.

5. Estimated Costs / Economic Impacts and the Impacted Sectors / Entities

The cost of a small can of refrigerant is approximately \$10 per can. There are anywhere from 2 million to 4 million small cans sold in California per year. Thus, a complete ban on the sale of small cans would result in the elimination of about \$23 million to \$40 million dollars per year of small can sales. Dividing this cost by the estimated emission reductions gives a preliminary cost effectiveness range of from about \$ 12 to \$ 40 per MTCO₂E. The true cost and cost effectiveness numbers may be much less if one considers only the actual profit margin per can, rather than the total cost of the can at retail.

The professional auto A/C servicing industry would benefit significantly from the increase in demand of its services and at the expense of the DIY, who would see her A/C service costs climb from a cost per can of HFC-134a of approximately \$10 to the cost of professional A/C servicing of more than \$100. Industry has recently determined a windfall profit to the professional mechanic, who in 2006 on average charges \$147 for recharge service, on the order of more than \$166 million. It appears that lower-income individuals may be more affected by this measure than others since they would do their own MVACS servicing rather than paying someone. On the other hand, the use of professionals in servicing automobile A/C systems would probably result in reduced emissions and A/C systems operating in a more efficient manner. Professional technicians have the experience, training and proper equipment to service and repair these complex systems. So there would be a benefit to the sales restriction approach

Industry has proposed the implementation of a refrigerant can return program along with refrigerant recovery of the unused contents. Costs and cost effectiveness of this proposal are yet to be determined. This proposal would target one specific component of the emissions from the DIY practitioners, the can heel. Industry has said that they would support the inclusion of a leak check requirement in the Smog Check Program. This alternative would certainly lessen the cost impacts on the low-income population although the price of the refrigerant would probably increase due to the use of self-sealing valves and the set-up and operation of a can return and refrigerant recovery program.

6. Technical Feasibility

The form of this discrete early action has not been determined. One proposal calls for a restriction on the sales of small cans of refrigerant. This regulatory proposal would not be considered a technology-based regulation, because it would basically prohibit the sale of small cans of refrigerant. The alternate proposal from industry would reduce emissions from the unused refrigerant remaining in the used can by the installation of self-sealing valves on the refrigerant containers and the recovery of the refrigerant remaining in the used can. Self-sealing valves are used on some containers of the

product so it is an accepted technology. There is still some uncertainty how refrigerant recovery from the used containers would work although it would seem to be technically feasible.

7. Additional Considerations

The state of Wisconsin has passed regulations restricting the sale and use of HFC-134a. In addition, several local air districts in California have regulations prohibiting the release of refrigerants into the atmosphere and, in some districts, restricting the sale of small cans.

This proposed regulation is a CAT strategy and would fall under the jurisdiction of ARB since it involves emissions of the refrigerant into the atmosphere. Under the Global Warming Solutions Act, AB 32, the ARB has the regulatory authority to restrict the sale and use of HFC-134a, a high-GWP refrigerant, in this particular sector. As an Early Action Item this proposed regulation will be taken to the Board by early 2009.

8. Division:	Research Division
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9. References:

Sciince, F., "Society of Automotive Engineers Improved Mobile Air Conditioning Cooperative Research Program," SAE 7th Alternate Refrigerant Systems Symposium, Scottsdale, AZ, June, 2006.

U.S. Consumer Buying Behaviors of R-134a Refrigerant for Light Vehicle Applications, Draft Report by Frost & Sullivan for the Automotive Refrigeration Products Institute, September 2006.

Personal communication. Rick Raborn, Sexton Can Company.

Atkinson, W., "Emissions from Refrigerant Containers, EPA Study," SAE 7th Alternate Refrigerant Systems Symposium, Scottsdale, AZ, June, 2006.

"Reducing Global Warming Emissions...while still enabling motorists to work on their car's air conditioner." Working presentation to CARB and EPA by ARPI, Dec. 13, 2006, Sacramento, CA.